

What is claimed is:

1. A mover combination comprising:

2 a mover that defines a first passageway and a second passageway
including an inlet, the first passageway at least partly encircling a portion of
4 the second passageway; and

6 a circulation system comprising a fluid source that directs a first fluid
to the first passageway and a second fluid to the second passageway,
wherein the second fluid is approximately boiling at the inlet.

2. The mover combination of claim 1 wherein the mover includes an

2 outer surface and fluid source controls the temperature and flow of the first fluid so
that the temperature of the outer surface is approximately equal to an ambient
4 temperature.

3. The mover combination of claim 1 wherein the second fluid is within

2 approximately 5 degrees C of boiling at the inlet.

4. The mover combination of claim 3 wherein the second fluid is within

2 approximately 1 degree C of boiling at the inlet.

5. The mover combination of claim 1 wherein the mover is positioned in

2 a room that is at a room temperature, and wherein the temperature of the first fluid
at the first inlet is approximately equal to the room temperature.

6. The mover combination of claim 1 further comprising a mover having

2 a magnet component and a conductor component.

7. The mover combination of claim 6 wherein the passageways are

2 positioned within the conductor component.

8. The mover combination of claim 1 wherein the first passageway

2 encircles at least a portion the second passageway.

9. The mover combination of claim 1 wherein the second passageway
2 includes an outlet, wherein the second fluid that exits from the outlet is at
temperature that is approximately boiling.

10. The mover combination of claim 1 wherein the circulation system
2 creates at least a partial vacuum in at least one of the passageways.

11. The mover combination of claim 1 wherein the circulation system
2 creates at least a partial vacuum in the second passageway.

12. The mover combination of claim 1 wherein the mover includes a
2 magnet component having a pair of spaced apart magnet arrays and a conductor
component includes a conductor array positioned between the magnet arrays.

13. The mover combination of claim 1 wherein the mover is a linear
2 motor.

14. The mover combination of claim 1 wherein the mover is a voice coil
2 motor.

15. An isolation system including the mover combination of claim 1.

16. A stage assembly including the mover combination of claim 1.

17. An exposure apparatus including the mover combination of claim 1.

18. An object on which an image has been formed by the exposure
2 apparatus of claim 17.

19. A semiconductor wafer on which an image has been formed by the
2 exposure apparatus of claim 17.

20. A mover combination comprising:

2 a mover including a magnet component, and a conductor
4 component, the mover also including a first passageway and a sealed
second passageway; and

6 a fluid source that circulates a first fluid through the first
passageway.

21. The mover combination of claim 20 wherein the second passageway

2 is filled with a second fluid that is a gas.

22. The mover combination of claim 21 further comprising a heat

2 transferer that is in direct thermal communication with the conductor component
and transfers heat from the conductor component.

23. The mover combination of claim 22 wherein the mover includes a

2 third passageway and the heat transferer transfers heat from the conductor
component to the third passageway.

24. The mover combination of claim 23 wherein the fluid source

2 circulates a third fluid through the third passageway.

25. The mover combination of claim 23 wherein the heat transferer

2 includes a heat pipe.

26. A mover combination of claim 23 wherein the heat transferer

2 includes a thermally conductive structure.

27. The mover combination of claim 20 wherein the mover is positioned

2 in a room that is at a room temperature, and wherein a temperature of the first
fluid in the first passageway is approximately equal to the room temperature.

28. An isolation system including the mover combination of claim 20.

29. A stage assembly including the mover combination of claim 20.

30. An exposure apparatus including the mover combination of claim 20.

31. An object on which an image has been formed by the exposure
2 apparatus of claim 30.

32. A semiconductor wafer on which an image has been formed by the
2 exposure apparatus of claim 30.

33. A method for controlling the temperature of a mover, the mover
2 including a first passageway having a first inlet and a second passageway having
a second inlet, the first passageway at least partly encircling a portion of the
4 second passageway, the method comprising the steps of:

6 directing a first fluid from a fluid source into the first inlet; and

8 directing a second fluid from the fluid source into the second inlet,
wherein a temperature of the second fluid at the second inlet is
approximately equal to the boiling temperature of the second fluid at an
absolute pressure within the second passageway.

34. The method of claim 33 wherein the temperature of the second fluid
2 at the second inlet is within at least approximately 2 degrees C of the boiling
temperature of the second fluid at an absolute pressure within the second
4 passageway.

35. The method of claim 33 wherein the temperature of the second fluid
2 at the second inlet is within at least approximately 1 degrees C of the boiling
temperature of the second fluid at an absolute pressure within the second
4 passageway.

36. The method of claim 38 wherein the second passageway includes a
2 second outlet and wherein temperature of the second fluid at the second outlet is
within at least approximately 1 degree C of the boiling temperature of the second
4 fluid at an absolute pressure within the second passageway.

37. A method for making a mover combination, the method comprising
2 the steps of: (i) providing a mover having a magnet component and a conductor
component and (ii) controlling the temperature of the mover with the method of
4 claim 33.

38. The method of claim 37 wherein the mover is positioned in a room
2 that is at a room temperature, and wherein the temperature of the first fluid at the
first inlet is approximately equal to the room temperature.

39. A method for making an isolation system comprising the steps of
2 providing an mover and circulation of the fluids around the mover pursuant to the
method of claim 33.

40. A method for making a stage assembly comprising the steps of
2 providing an mover that moves a stage and circulation of the fluids around the
mover pursuant to the method of claim 33.

41. A method for making an exposure apparatus comprising the steps of
2 providing a mover and circulation of the fluids around the mover pursuant to the
method of claim 33.

42. A method of making a wafer utilizing the exposure apparatus made
2 by the method of claim 41.

43. A method for controlling the temperature of a mover, the mover
2 including a magnet component and a conductor component, the method
comprising the steps of:

4 providing a first passageway in the mover, the first passageway
having a first inlet;
6 providing a sealed second passageway in the mover; and
circulating a first fluid from a fluid source through the first
8 passageway.

44. The method of claim 43 further comprising the step of transferring
2 heat from a conductor array of the conductor component with a heat transferer.

45. The method of claim 44 including the step of providing a third
2 passageway in the mover and the heat transferer transfers heat from the
conductor component to the third passageway.

46. The method of claim 45 further comprising the step of circulating a
2 third fluid through the third passageway.

47. The method of claim 44 wherein the heat transferer includes a heat
2 pipe.

48. The method of claim 44 wherein the heat transferer includes a
2 thermally conductive structure.

49. A method for making a mover combination, the method comprising
2 the steps of: (i) providing a mover having a magnet component and a conductor
component and (ii) controlling the temperature of the mover with the method of
4 claim 43.

50. The method of claim 49 wherein the mover is positioned in a room
2 that is at a room temperature, and wherein the temperature of the first fluid at the
first inlet is approximately equal to the room temperature.

51. A method for making an isolation system comprising the steps of
2 providing a mover and circulation of the fluids around the mover pursuant to the
method of claim 43.

52. A method for making a stage assembly comprising the steps of
2 providing an mover that moves a stage and circulation of the fluids around the
mover pursuant to the method of claim 43.

53. A method for making an exposure apparatus comprising the steps of
2 providing a mover and circulation of the fluids around the mover pursuant to the
method of claim 43.

54. A method of making a wafer utilizing the exposure apparatus made
2 by the method of claim 53.

55. A method of making a device utilizing the exposure apparatus made
2 by the method of claim 53.